DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

3N204-3N205

DUAL GATE MOSFET VHF AMPLIFIER

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-source voltage	V_{DS}	25	Vdc
Drain-gate voltage	V_{DG1}	30	Vdc
	V_{DG2}		
Drain current	I_D	50	mAdc
Gate current	I_{G1}	±10	mAdc
	I_{G2}		
Total device dissipation @ T_A = 25°C **Derate above 25°C**	P_D	360 2.4	mW mW/°C
Total device dissipation @ T_C = 25°C **Derate above 25°C**	P_D	1.2 8.0	W mW/°C
Lead temperature	T_L	300	°C
Junction temperature range	T_J	-65 to 175	°C
Storage temperature range	T_{stg}	-65 to 175	°C

ELECTRICAL CHARACTERISTICS (T_C = 25°C)

Characteristics	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage (I_D=10µA, V_{G1}=V_{G2}=-5.0V)	$V_{(BR)DSX}$	25	-	Vdc
Gate 1-Source Breakdown Voltage (I_{G1}=+/- 10 mA) Note 1	$V_{(BR)G1SO}$	+/-6	+/-30	Vdc
Gate 2-Source Breakdown Voltage (I_{G2}=+/-10mA) Note 1	$V_{(BR)G2SO}$	+/-6	+/-30	Vdc
Gate 1 Leakage Current (V_{G1S}=+/-5.0V, V_{G2S}=V_{DS}=0)	I_{G1SS}	-	+/-10	nA
Gate 2 Leakage Current (V_{G2S}=+/-5.0V, V_{G1S}=V_{DS}=0)	I_{G2SS}	-	+/-10	nA
Gate 1 to Source Cutoff Voltage (V_{DS}=15V, V_{G2S}=4.0V, I_D=20µA)	$V_{G1S(off)}$	-0.5	-4.0	Vdc
Gate 2 to Source Cutoff Voltage (V_{DS}=15V, V_{G1S}=0V, I_D=20µA)	$V_{G2S(off)}$	-0.2	-4.0	Vdc
ON CHARACTERISTICS				
Zero-Gate-Voltage Drain Current * (V_{DS}=15V, V_{G2S}=4.0V, V_{G1S}=0V)	I_{DSS}*	6	30	mA
SMALL SIGNAL CHARACTERISTICS				
Forward Transfer Admittance (V_{DS}=15V, V_{G2S}=4.0V, V_{G1S}=0V, f=1.0kHz) Note 2	$\|Y_{fs}\|$	10	22	mmhos
Input Capacitance (V_{DS}=15V, V_{G2S}=4.0V, I_D=I_{DSS}, f=1.0Mhz)	C_{iss}	TYP.3.0		pF
Reverse Transfer Capacitance (V_{DS}=15V, V_{G2S}=4.0V, I_D=10mA, f=1.0MHz)	C_{rss}	0.005	0.03	pF
Output Capacitance (V_{DS}=15V, V_{G2S}=4.0V, I_D=I_{DSS}, f=1.0MHz)	C_{oss}	TYP. 1.4		pF

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FUNCTIONAL CHARACTERISTICS

Noise Figure (V_{DD}=18V, V_{GG}=7.0V, f=200MHz) 3N204 (V_{DS}=15V, V_{G2S}=4.0v, I_D=10mA, f=450MHZ) 3N204	NF	 - -	 3.5 5.0	dB
Common Source Power Gain (V_{DD}=18V, V_{GG}=7.0V, f=200MHz) 3N204 (V_{DS}=15V, V_{G2S}=4.0V, I_D=10mA, f=450MHz) 3N204	G_{ps}	 20 14	 28 -	dB
Bandwidth (V_{DD}=18V, V_{GG}=7.0V, f=200MHz) 3N204 (V_{DD}=18V, f_{LO}=245MHz, f_{RF}=200MHz)$_{Note\ 4}$ 3N205	BW	 7.0 4.0	 12 7.0	MHz
Gain Control Gate Supply Voltage$_{(Note\ 3)}$ (V_{DD}=18V, △GPS=300dB,f=200MHz) 3N204	$V_{GG(GC)}$	0	-2.0	Vdc
Conversion Gain $_{(Note\ 4)}$ (V_{DD}=18V, f_{LO}=245MHz, f_{RF}=200MHz) 3N205	$G_{(conv.)}$	17	28	dB

*PW=30µs, Duty Cycle ≤ 2.0%.

1) All gate breakdown voltages are measured while the device is conducting rated gate current. This insures that the gate voltage limiting network is functioning properly.

2) This parameter must be measured with bias voltages applied for less than five (5) seconds to avoid overheating.

3) △G_{ps} is defined as the change in G_{ps} from the value at V_{GG}=7.0V.

4) Amplitude at input from local oscillator is 3 volts RMS.

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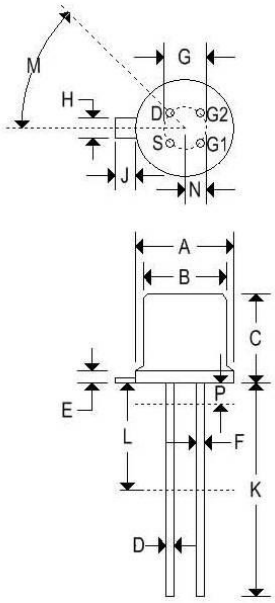
MECHANICAL CHARACTERISTICS

Case:	TO-72
Marking:	Body painted, alpha-numeric
Pin out:	See below



	TO-72			
	Inches		Millimeters	
	Min	Max	Min	Max
A	-	0.230	-	5.840
B	-	0.195	-	4.950
C	-	0.210	-	5.330
D	-	0.021	-	0.530
E	-	0.030	-	0.760
F	-	0.019	-	0.480
G	0.100 BSC		2.540 BSC	
H	-	0.046	-	1.170
J	-	0.048	-	1.220
K	0.500	-	12.700	-
L	0.250	-	-	6.350
M	45° BSC		45° BSC	
N	0.050 BDC		1.270 BSC	
P	-	0.050	-	1.270